DESIGN OF PRINCIPAL SPILLWAY

Exhibit 11-9 provides an alternate routing method for proportioning the principal spillway capacity and temporary storage requirements of ponds and reservoirs. This procedure will give satisfactory results for structure drainage areas up to 2000 acres with a single-stage principal spillway capacity that does not exceed 0.60 cfs per acre of drainage.

Exhibit 11-9 was developed from over 200 routings of typical embankment reservoirs limited to 24-hour rainfall durations with Type II distribution.

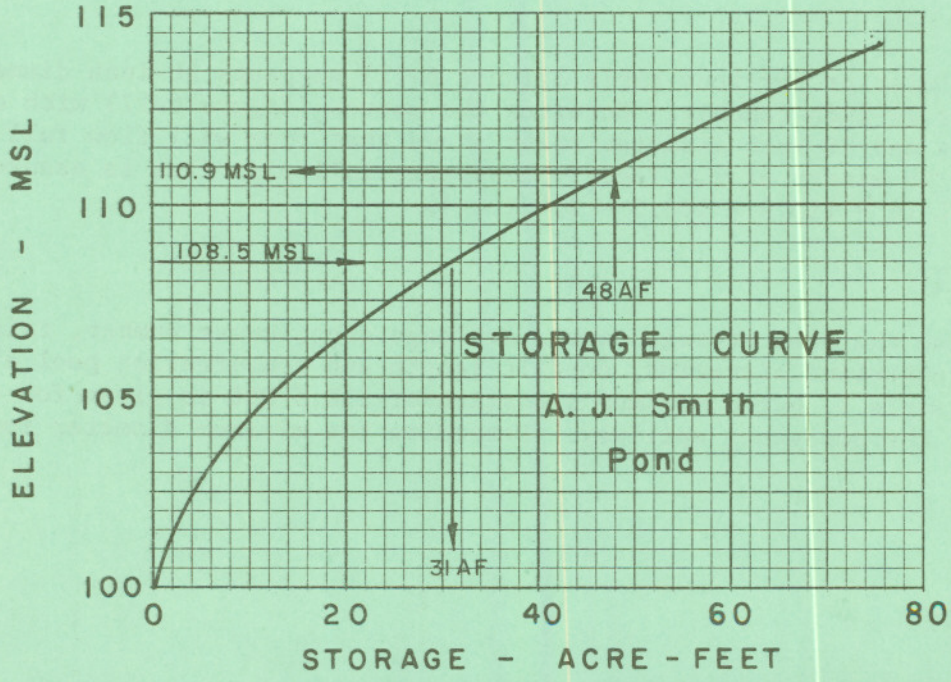
Quick return flow (QRF)[1/] can be a factor in sites where the QRF is significant when compared to the capacity of the principal spillway. Where applicable, QRF can be added to the release rate determined from exhibit 11-9 prior to the selection of a conduit size, or subtracted from the conduit capacity prior to determining required temporary storage from exhibit 11-9.

Example problems follow to illustrate the use of exhibit 11-9.

Example 1

Determine required volume of temporary storage for an embankment pond with the following conditions:

Drainage Area = 200 acres
Curve Number = 75
Rainfall = 4.5 inches
Conduit = 24-inch CMP - 70 feet long
Pipe Outlet Centerline Elevation = 100.0 MSL
Principal Spillway Crest = 108.5 MSL
Conservation Pool = 31 acre-feet @ 108.5 MSL



1/ Chapter 21, Section 4, SCS National Engineering Handbook (exhibit 21.3)